

EENG 4010/5940 Introduction to Photonics and Optical Engineering

Instructor: Shuping Wang

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Spring 2024

Time: (TuTh) 11:30 am - 12:50 pm

Meeting Place: NTDP B140

Office Hours: (TuTh) 2:00 pm - 4:00 pm

TA: Sudesna Das Rochi

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Office hours/Room: TuTh 1:00 - 2:00 pm, Room B241

Course Number, Title, Credit Hours

EENG 4010-007, Topics in Electrical Engineering, 3 hours.

EENG 5940-007, Advanced Topics in Electrical Engineering, 3 hours.

General Description

The nature of light and its properties, basic geometrical and physical optics, optical system and design considerations.

Course Information

Prerequisites

Knowledge of differential equations, EENG 3410 or equivalent is immensely helpful.

Textbooks

1. J. Peatross and M. Ware, *Physics of Light and Optics*, 2015 edition, available at optics.byu.edu (required, free download).
2. Optics, Eugene Hecht, Pearson Education, 5th edition, ISBN: 9780133977226, 2017. (Recommended, the older edition is ok)

Reference Texts

1. Optics for Engineers, Charles A. DiMarzio, CRC Press, 1th edition, ISBN: 9781439807255, 2011.
2. Modern Optical Engineering, W. Smith, McGraw Hill, 4th edition, ISBN: 9780071593755, 2008.

Attendance

Attendance is mandatory. Lecture periods will be utilized to present the principles and theory of the course topics. Class participation and discussion are expected in these sessions.

Homework

Homework will be assigned to help understand and reinforce the materials covered in the lecture. The HW is graded based on completion. HW solution will be posted after the due date.

- Homework needs to be uploaded to Canvas at the due date/time.

- Homework turned in late will be penalized 50%. No homework is accepted after 24 hours.
- Students have one week to contest any grade once the grade is posted.

Exams

There will be **three** exams (this includes the final exam), each worth 100 points. Exams will be based on text readings, handouts, class exercises, and class lectures and discussions. Students are responsible for all text material, regardless of whether we review the text material in class or not.

Missed Exams

There are **no** make-up Exams. If you cannot take the midterm exam for any reason, the weight of the midterm will be put onto the final, so that the final is worth 80% of your grade. Make-up exam accommodations for the Final Exam will only be made if you have a documented university excused absence (refer to UNT Policy 06.039).

Grading Elements and Weights

Homework	20%
Test 1	25%
Test 2	25%
Final Examination	30%

A	≥90%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	≤59%

Student Evaluation of Instruction

The Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This brief survey will be made available to you at the end of the semester, providing you with a chance to comment on how this class is taught. I am interested in the feedback I receive from students, as I work to continually improve my teaching. I consider the SPOT to be an important part of your participation in this class.

UNT Policies

ODA Policy

UNT makes reasonable academic accommodations for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time; however, ODA notices of accommodation

should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the [ODA website \(https://disability.unt.edu/\)](https://disability.unt.edu/).

Academic Integrity Policy

According to **UNT Policy 06.003**, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

Tentative Course Outline/Schedule

- Introduction, Wave Motion (1/16, 1/18, 1/23)
- Electromagnetic Theory, Photons, and Light (1/25, 1/30)
- The Propagation of Light (2/1, 2/6, 2/8, 2/13)
- **Test 1** (Tuesday, 2/20)
- Geometrical Optics and Fiberoptics (2/15, 2/20, 2/22, 2/27, 2/29, 3/5, 3/7)
- **Spring Break** (3/11 – 3/17)
- **Test 2** (Tuesday, 3/19)
- The Superposition of Wave/Interference (3/21, 3/26, 3/28, 4/2)
- Polarization (4/4, 4/9, 4/11, 4/16)
- Lasers (4/18, 4/23, 4/25)
- Review (4/30)
- **Final Exam:** 5/7/2024, Tuesday, 10:30am – 12:30pm